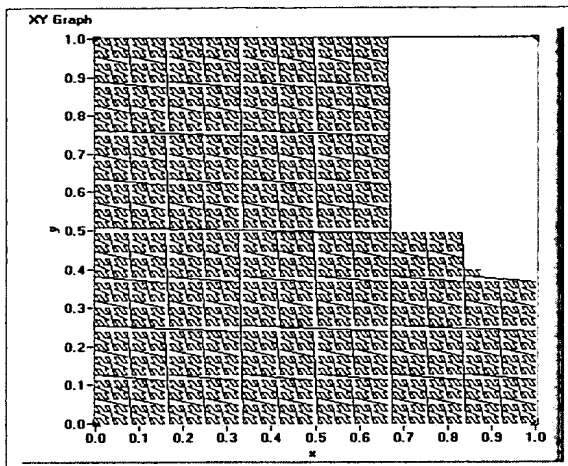
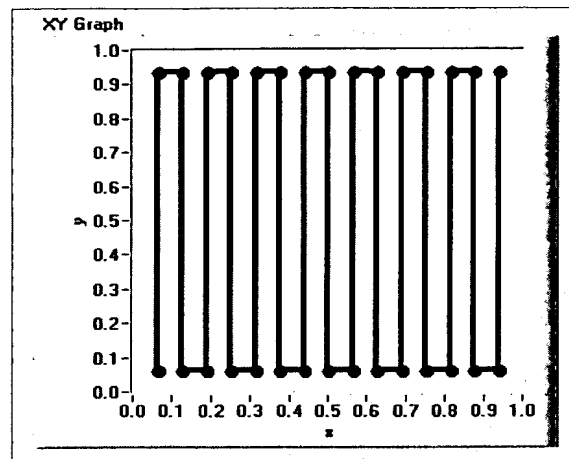


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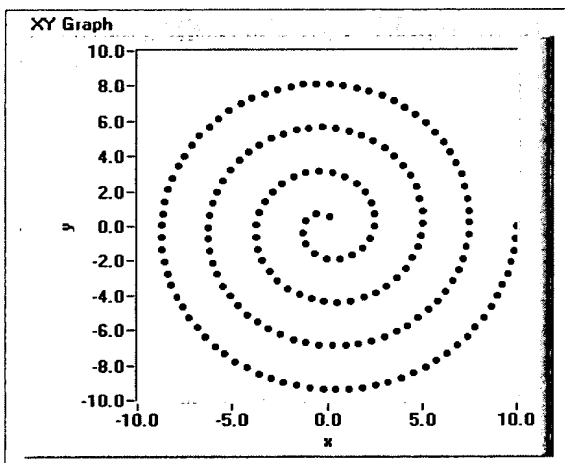
Approximated Peano Curve. The space-filling process has not been completed.

Figure 1A (Prior Art)



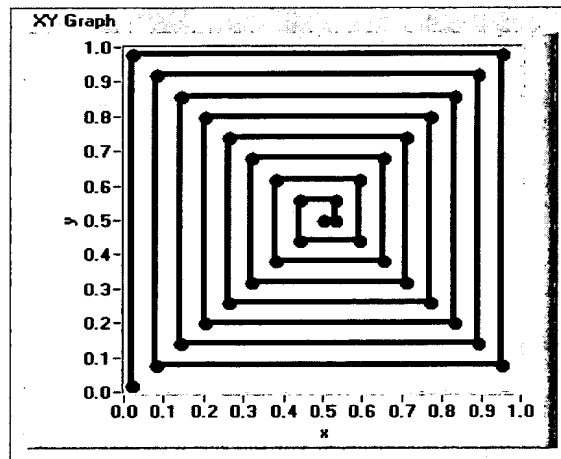
Boustrophedon Path

Figure 1B (Prior Art)



Archimedes Spiral defined by equally distributed points

Figure 1C (Prior Art)



Spiral-like line-based scanning

Figure 1D (Prior Art)

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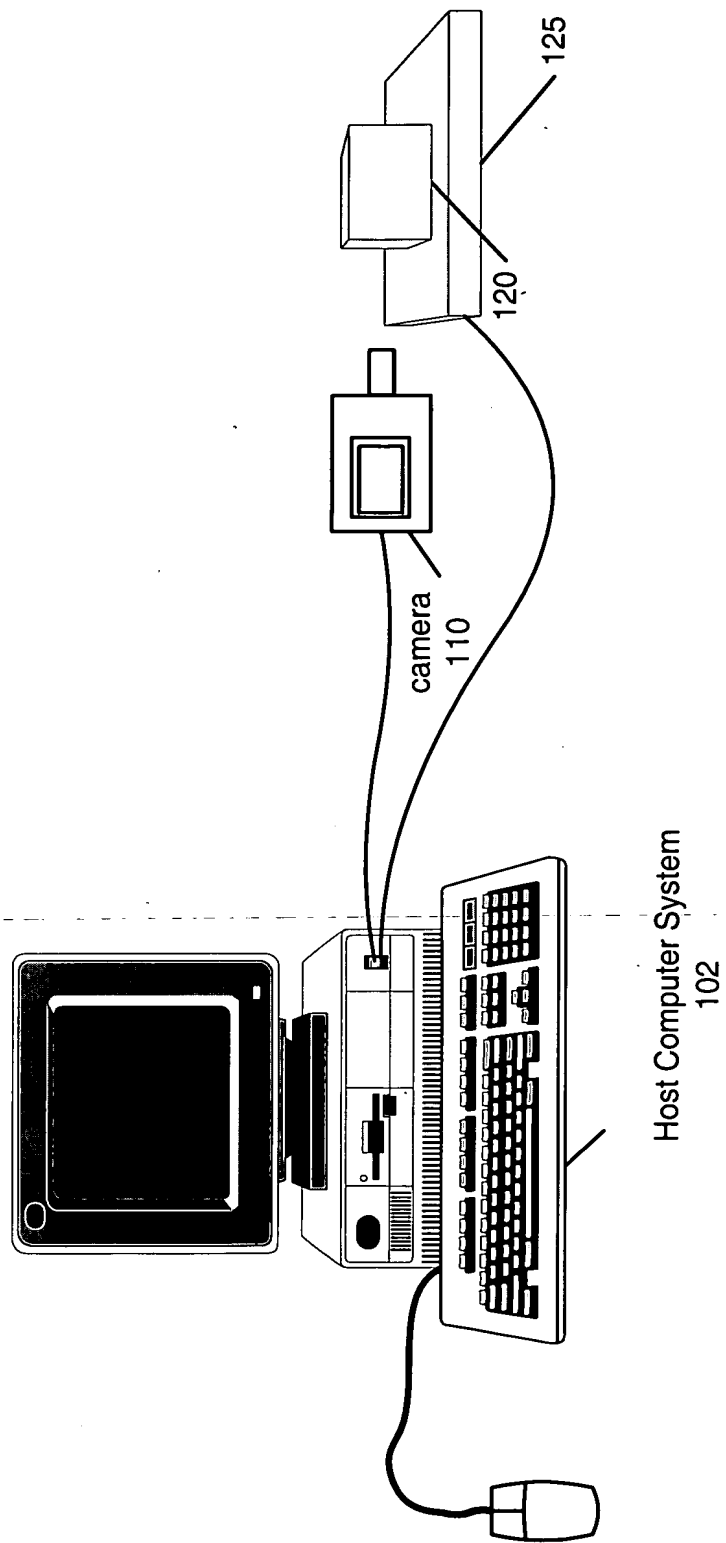


Figure 2A

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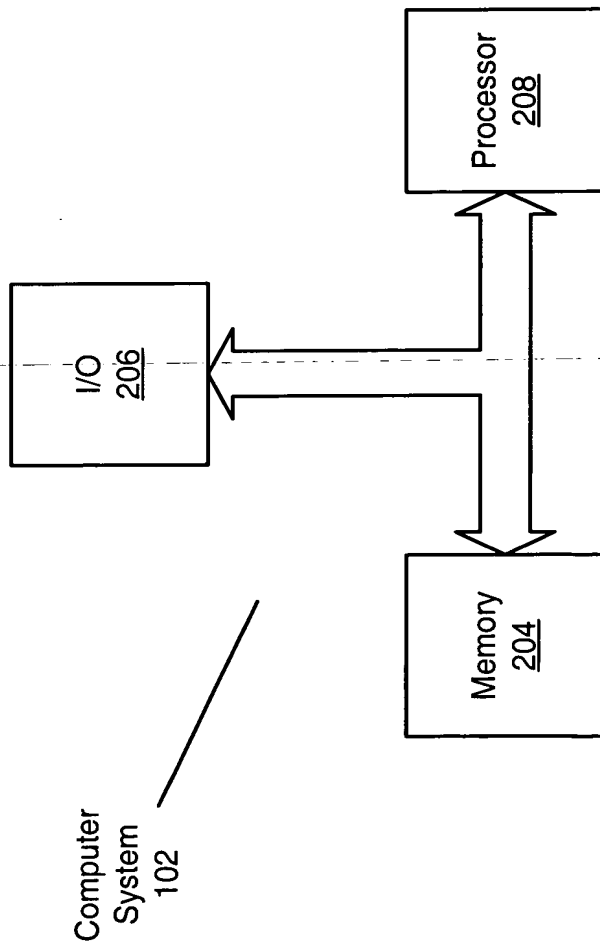


Figure 2B

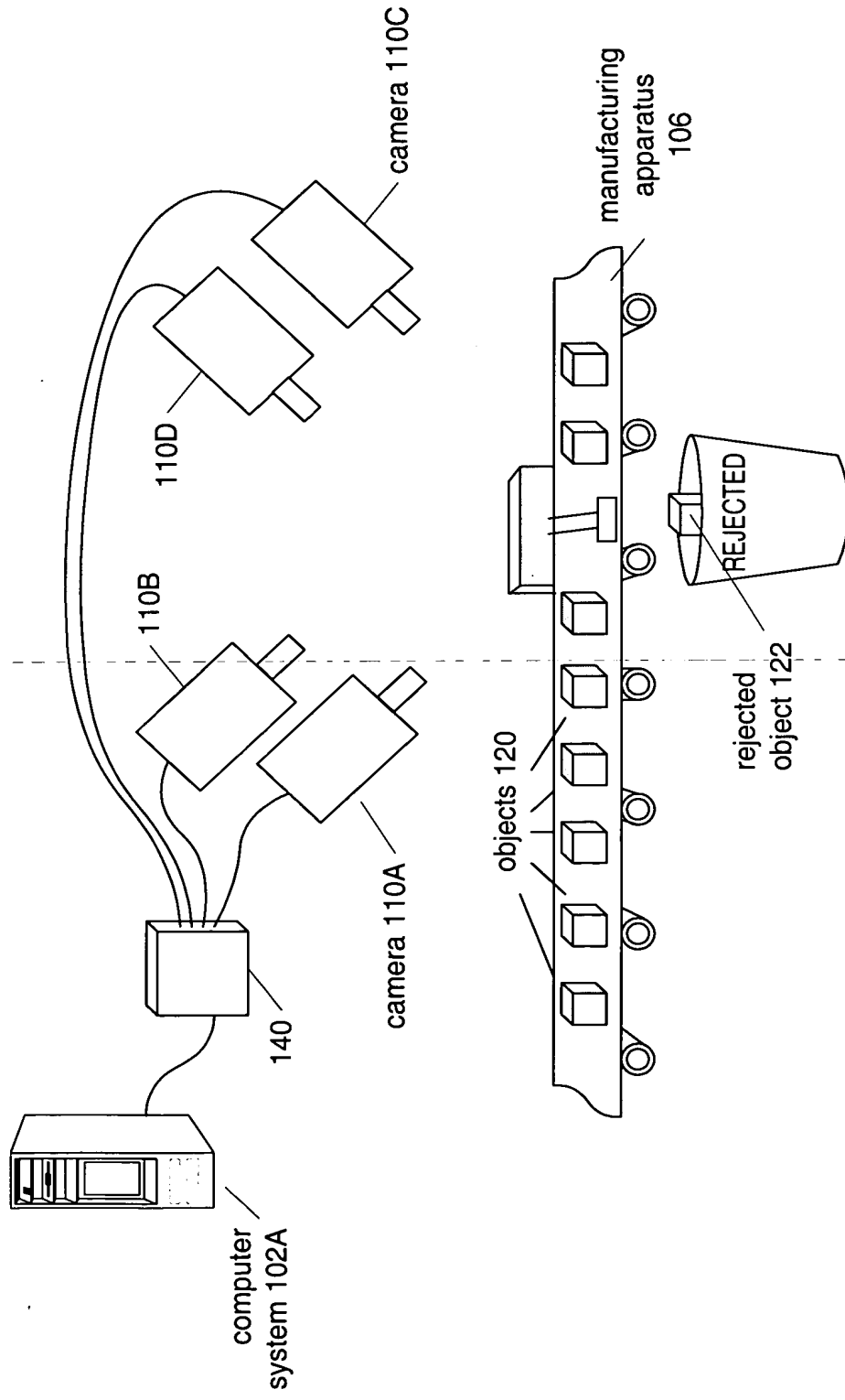


Figure 3A

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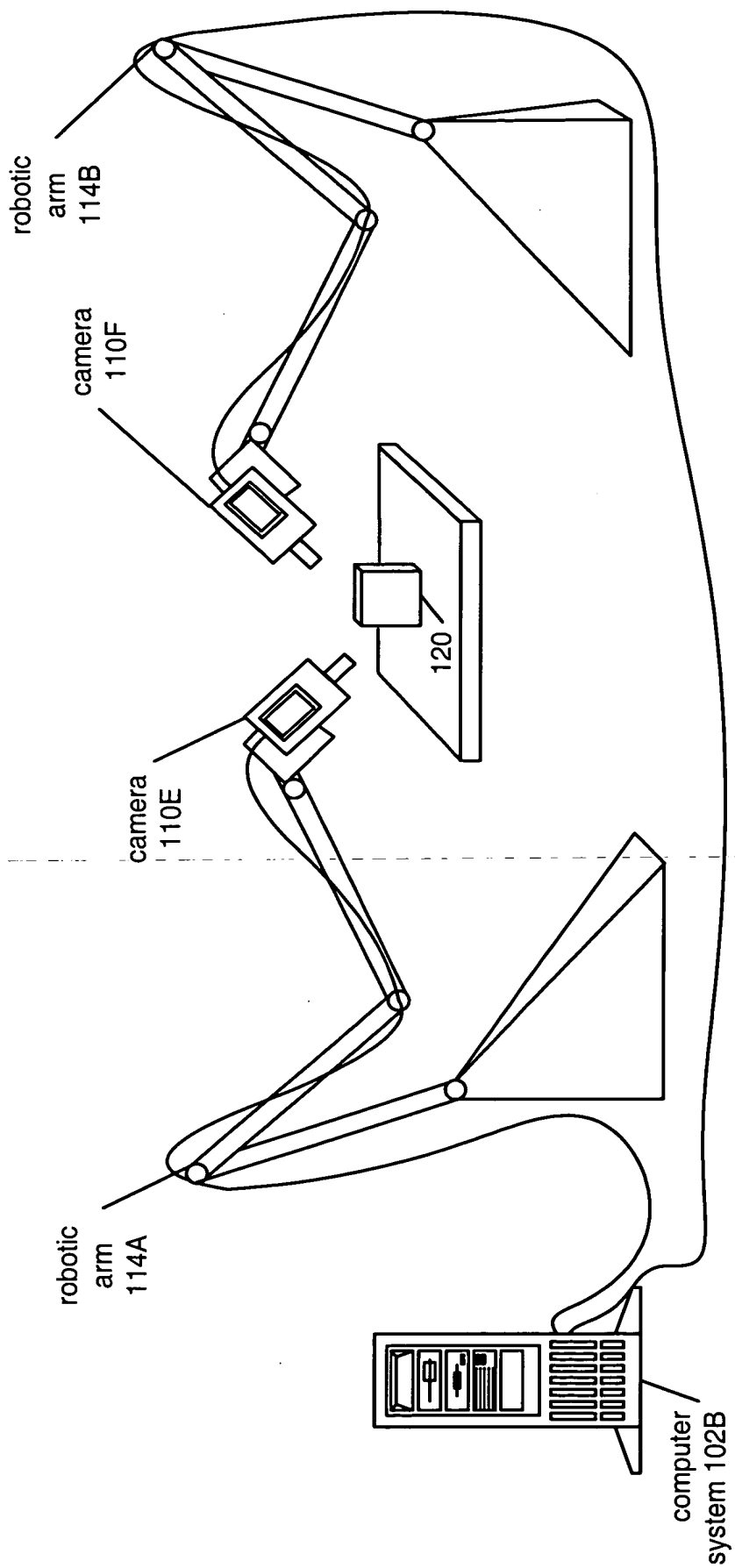


Figure 3B

Computer System
102C

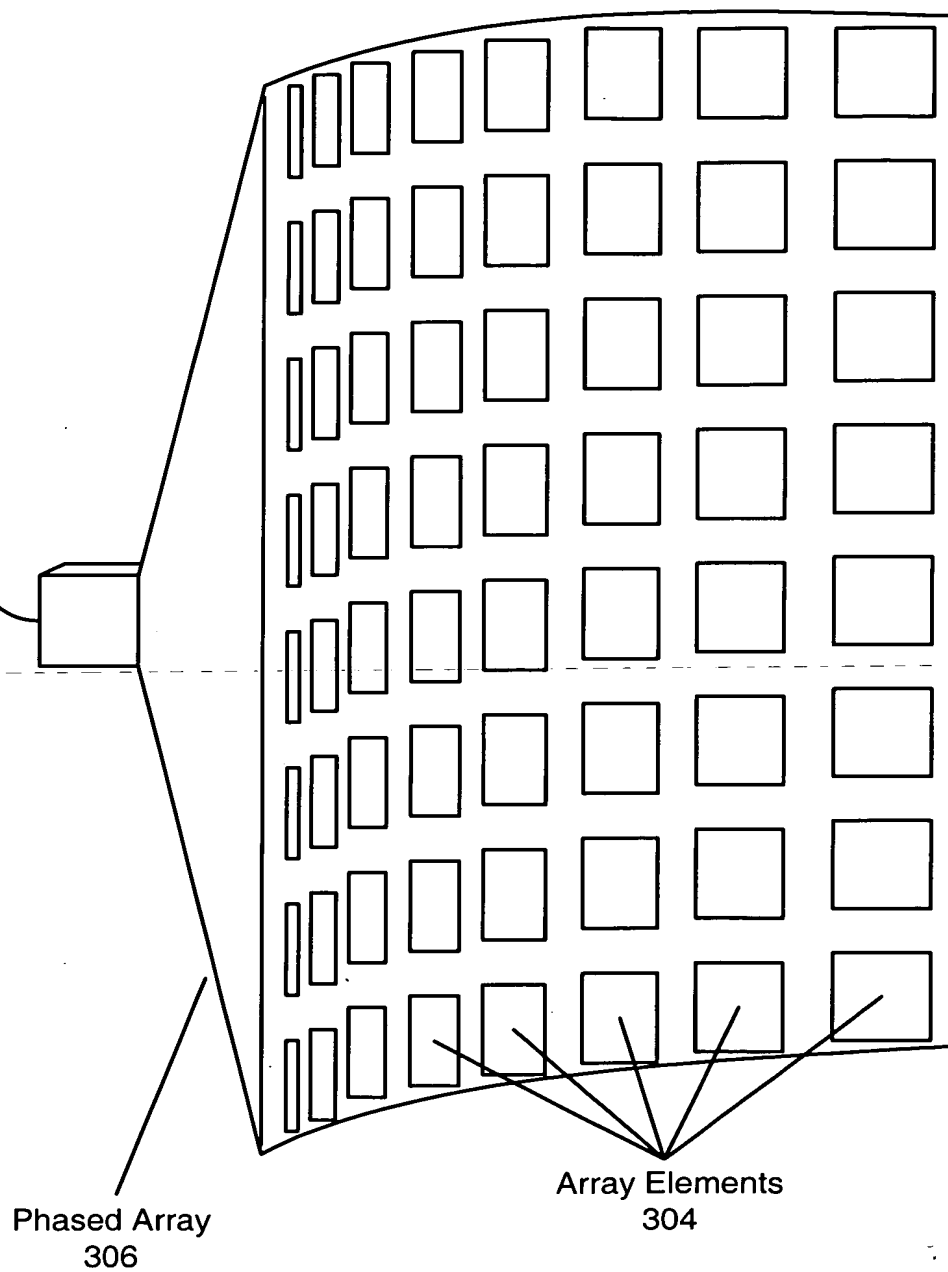


Figure 3C

108090-0869/860

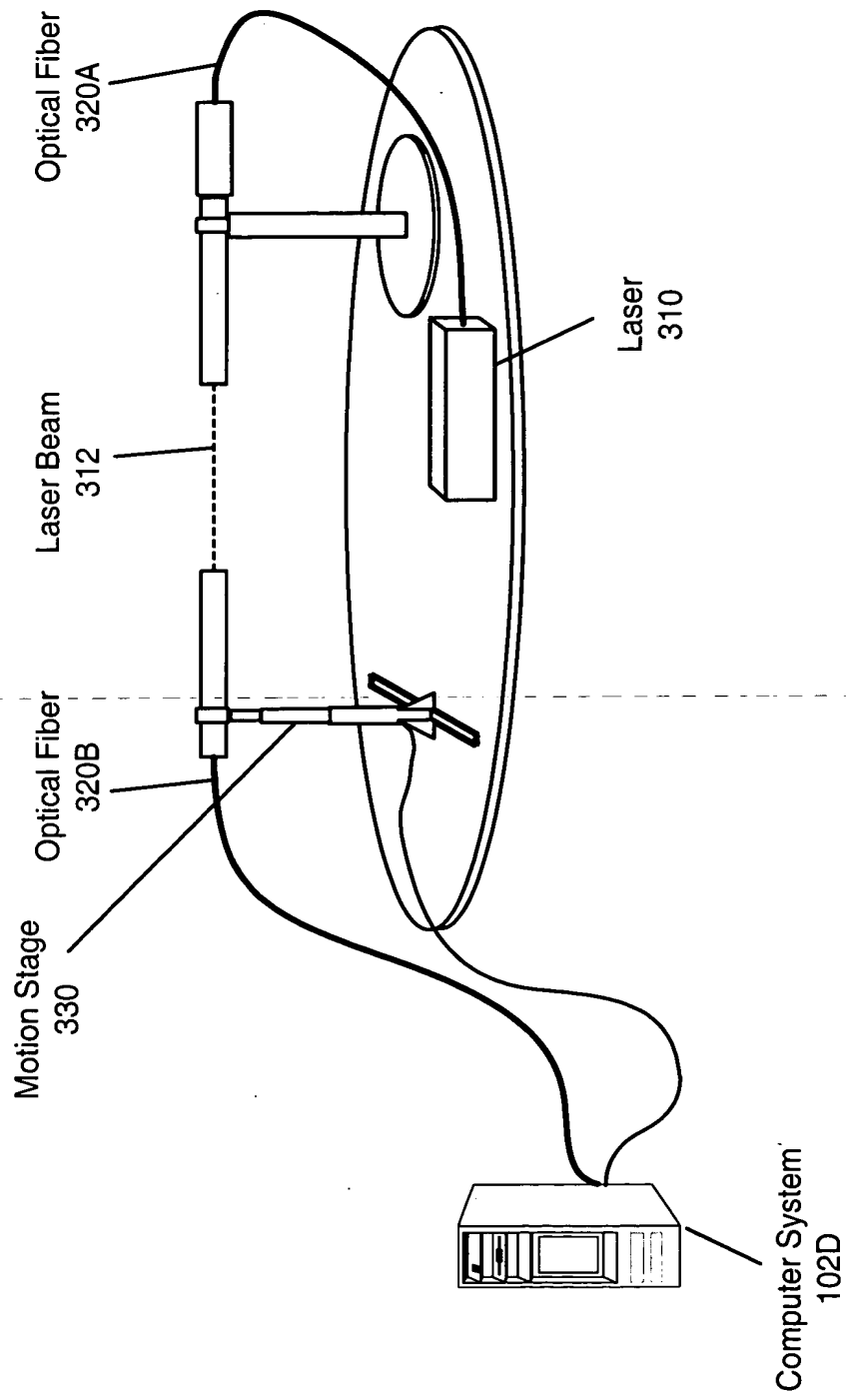
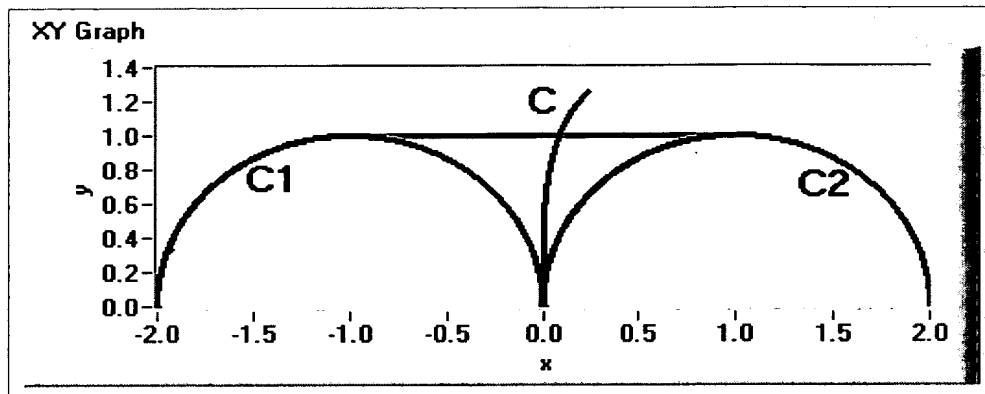


Figure 3D

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The situation of Lemma 1

Figure 4A

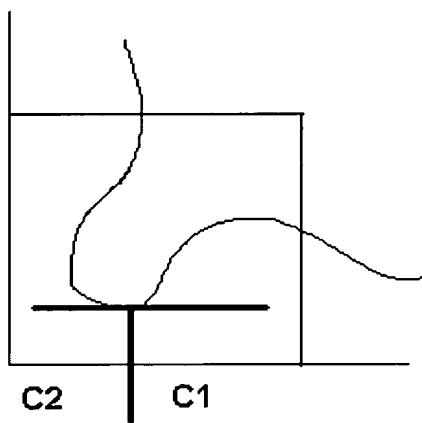


Figure 4B

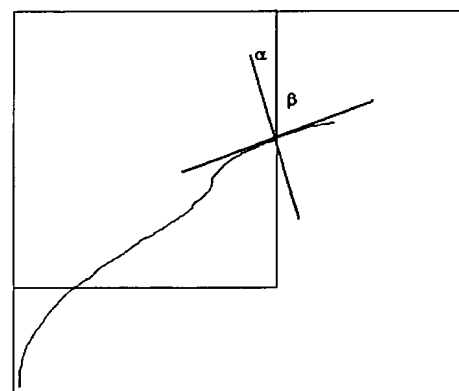
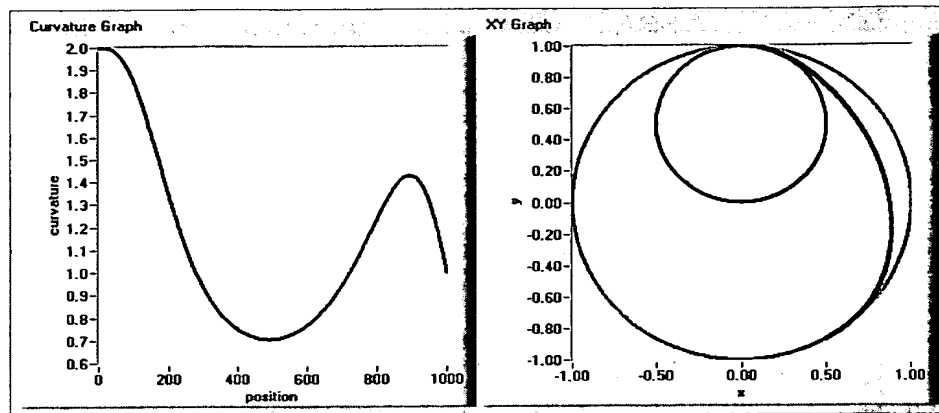
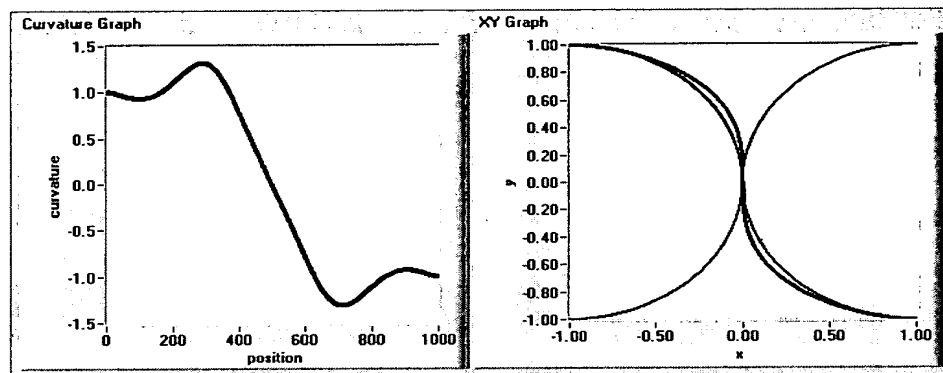


Figure 4C



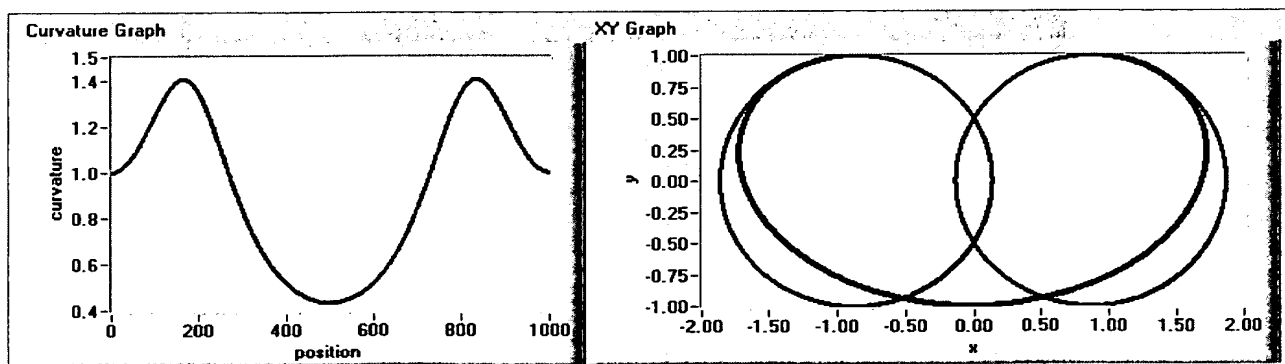
Smooth transition between two circles of different radii.

Figure 4D



Smooth transition between two circles of same radius.

Figure 4E

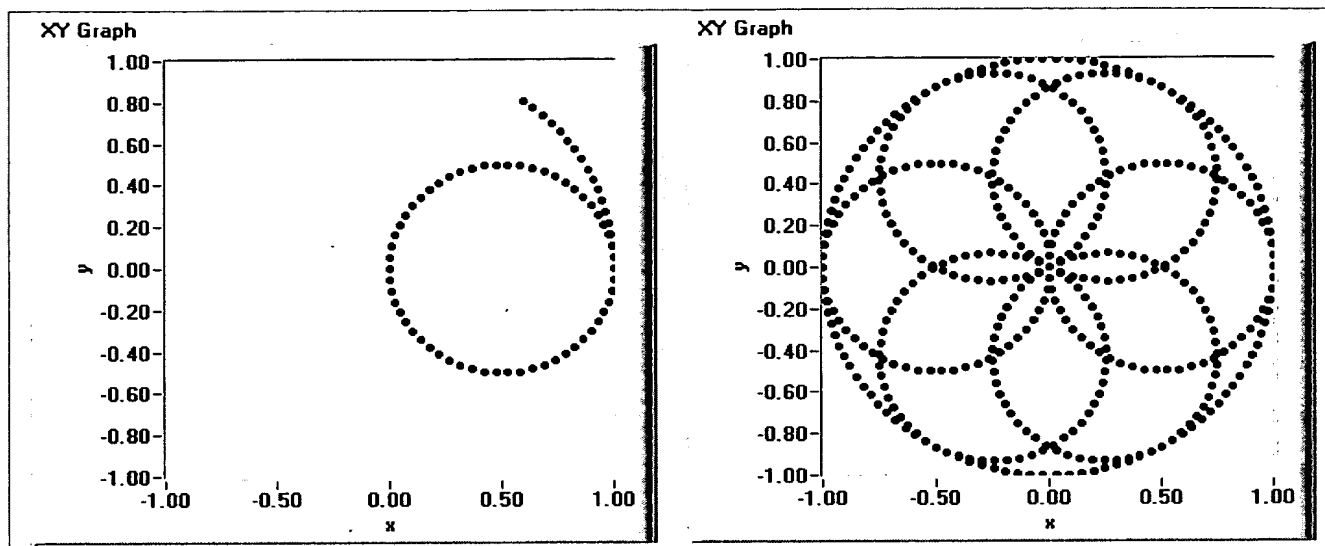


Transition between two unit circles of radius 1. The distance between the circles is $\sqrt{3}$

Figure 4F

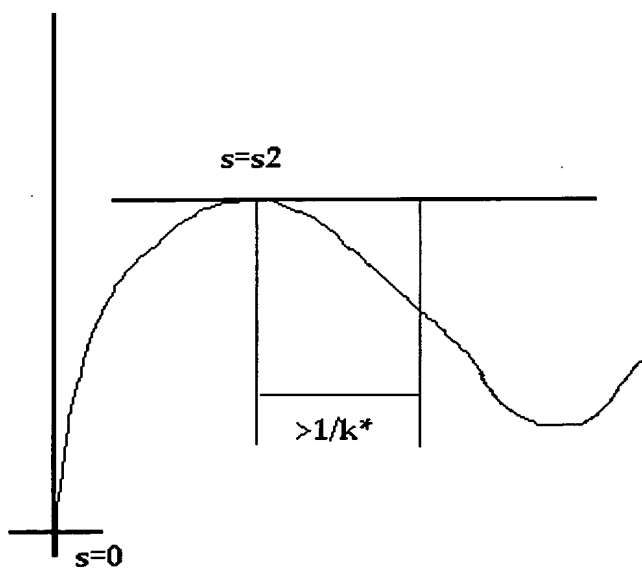
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Beginning (left) and completion (right) of a scanning scheme where the curvature is below a certain value

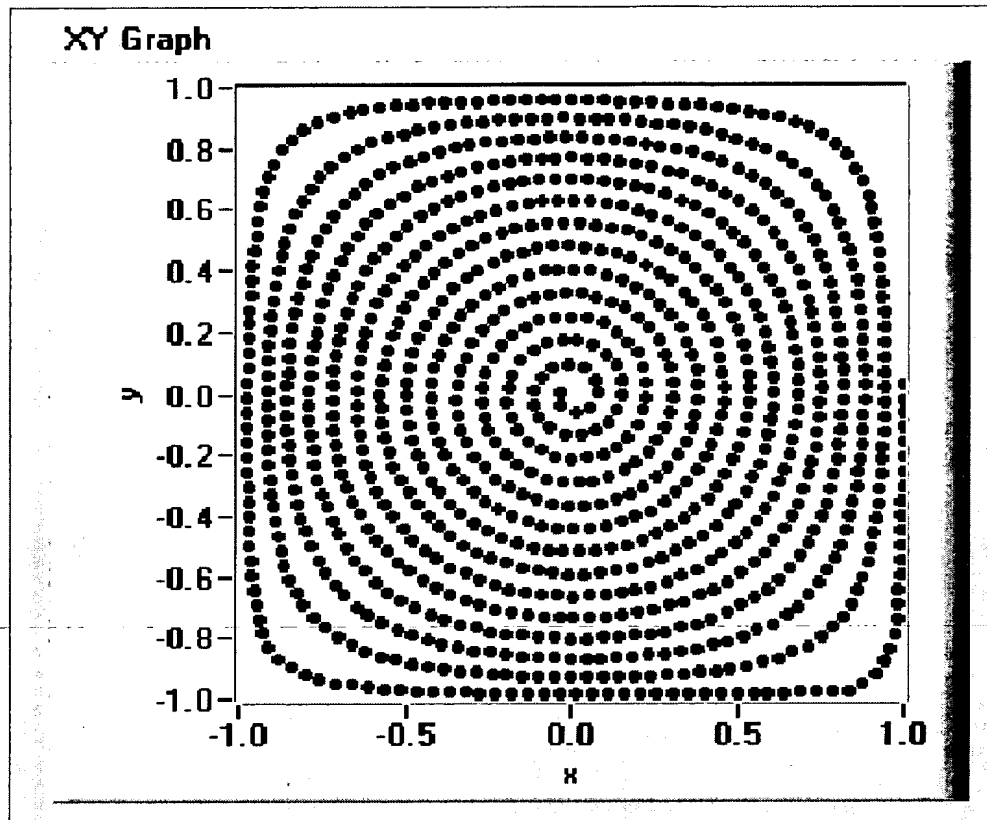
Figure 5A



Construction of s_2 and the subsequent part of the curve

Figure 5B

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Conformal Spiral.

Figure 6

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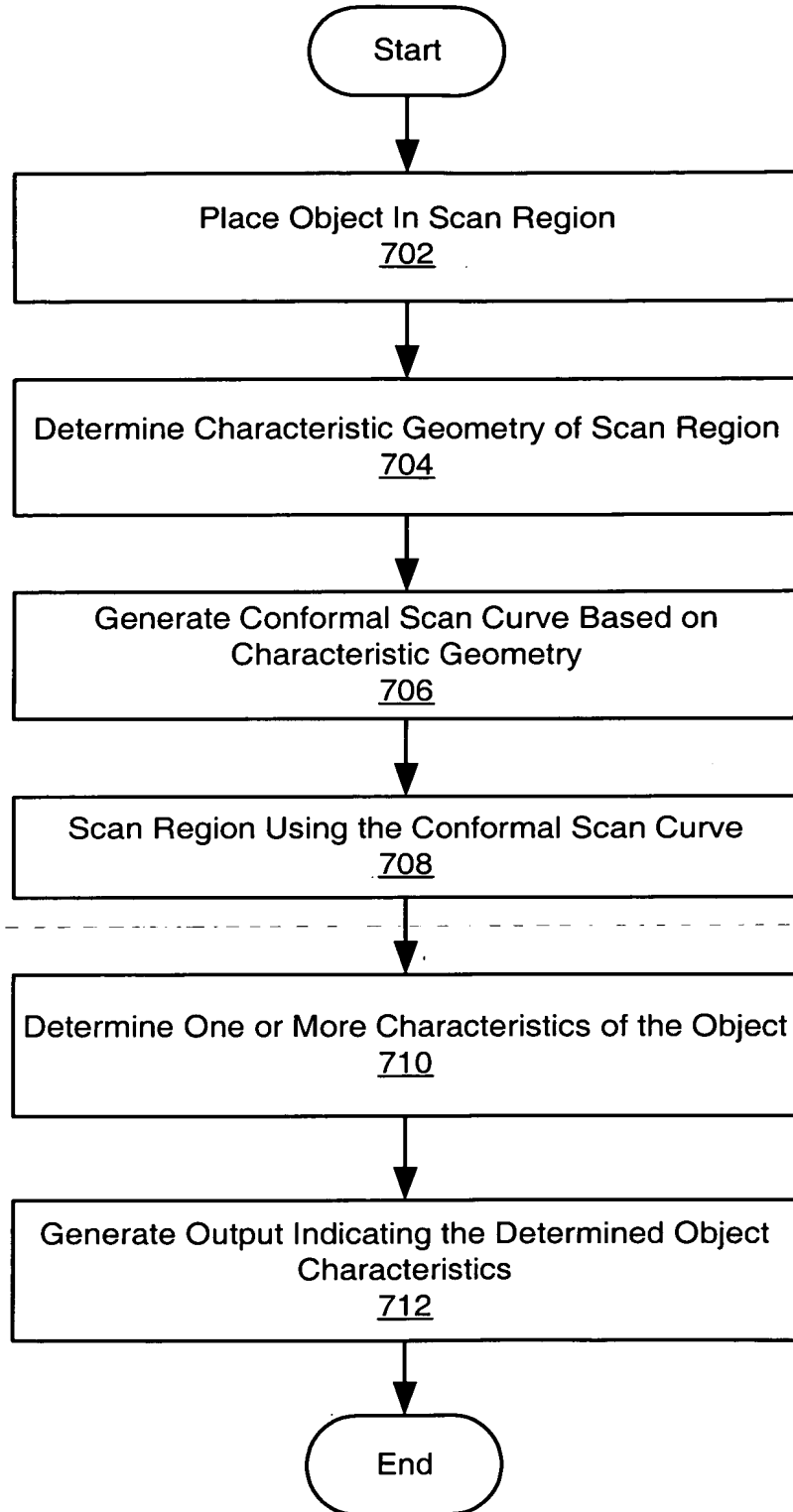
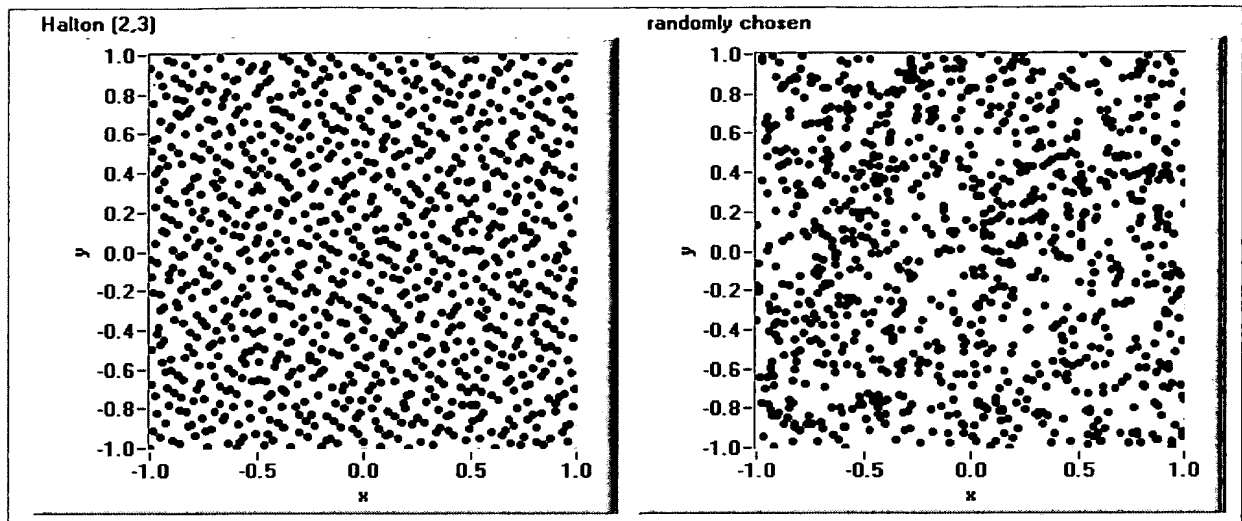


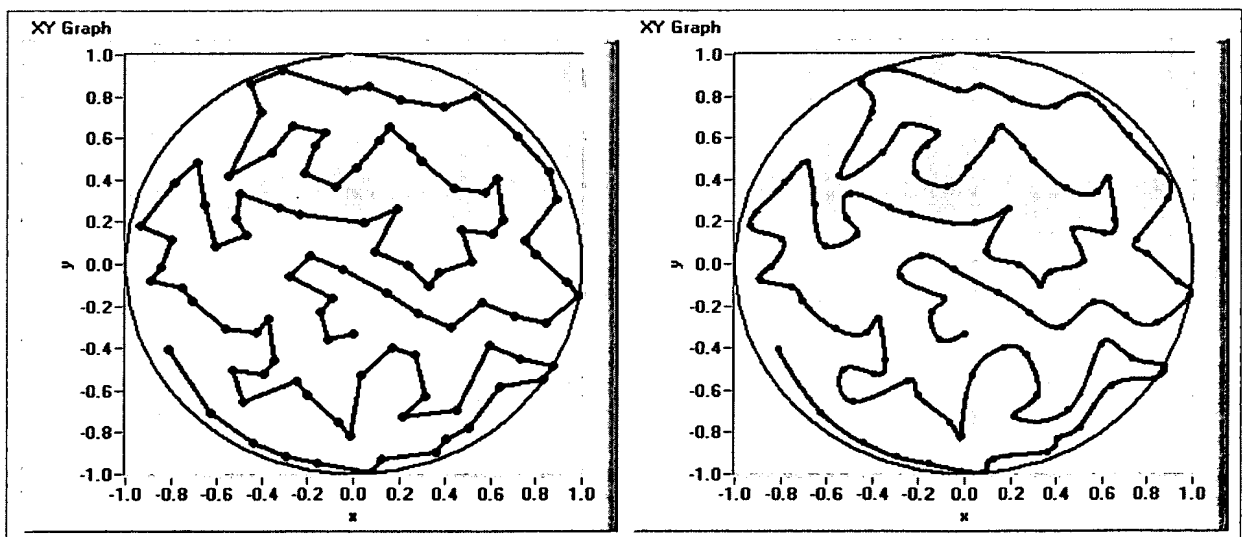
Figure 07

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The first 1000 Halton points (left) and randomly chosen points (right)

Figure 8A



Original solution (left) and splined version (right).

Figure 8B

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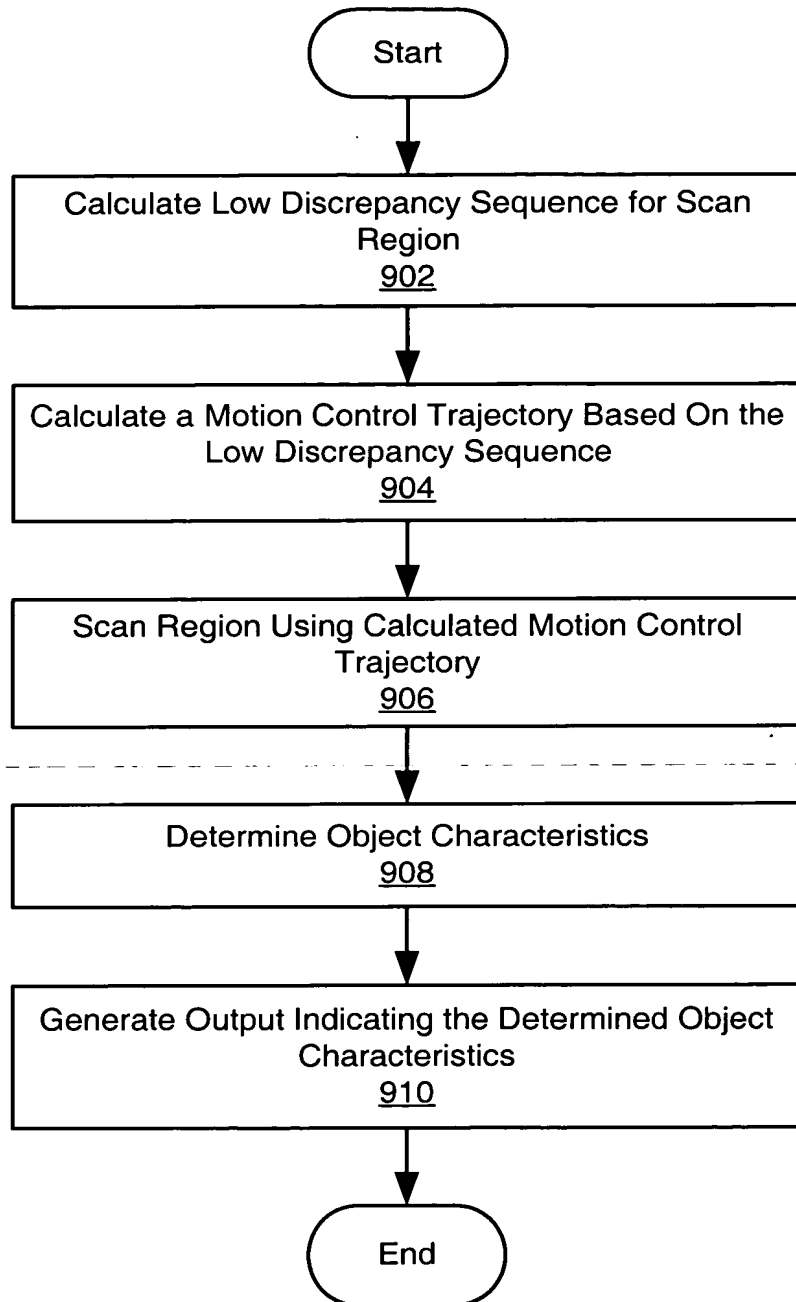
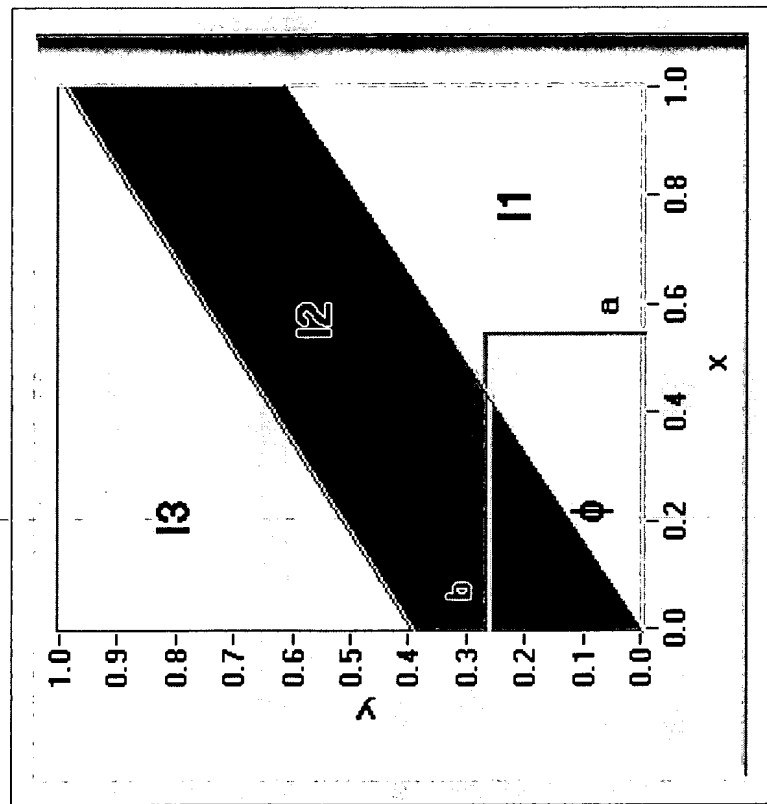


Figure 9



Definition of I_1 , I_2 , and I_3

Figure 10

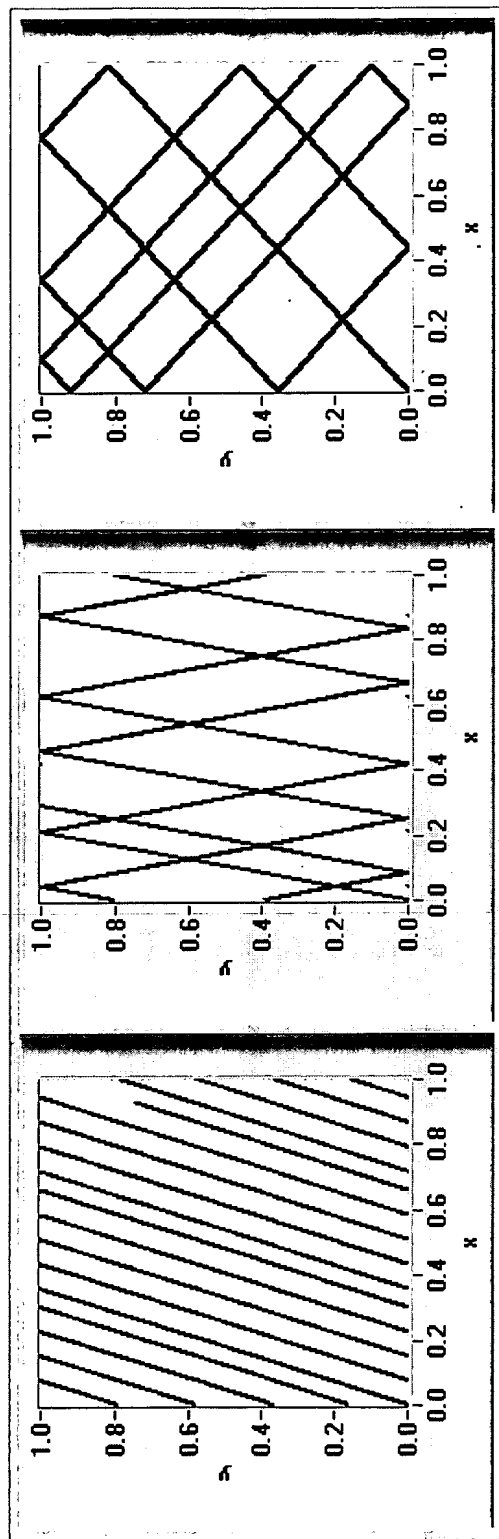


Figure 11A

Figure 11B

Figure 11C

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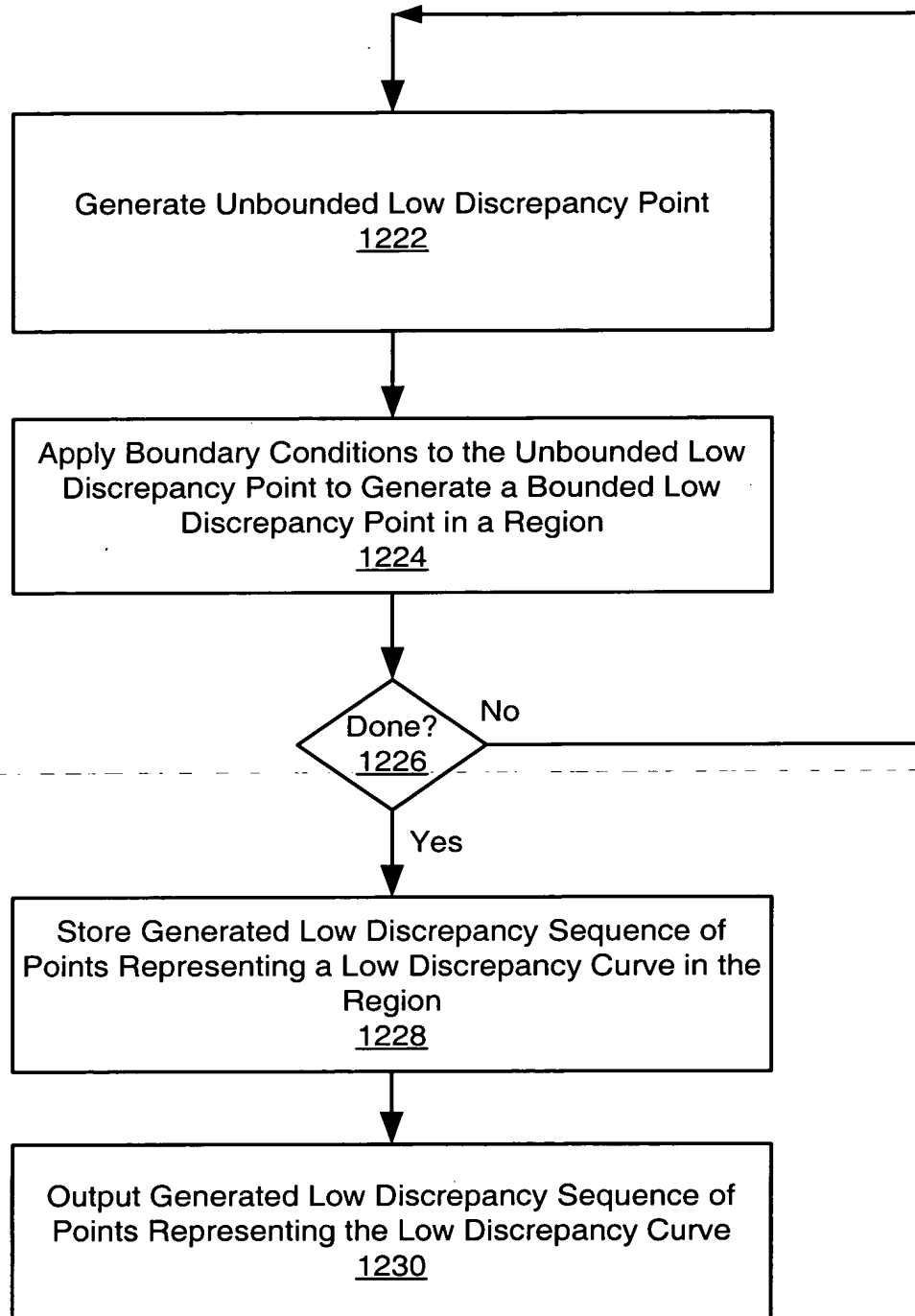


Figure 12A

Select a Pair of Irrational Numbers (α_1, α_2) such that the Sequence $\{(n \cdot \alpha_1) \bmod 1\}, \{(n \cdot \alpha_2) \bmod 1\}$ for all Natural Numbers n is a LDS in the Unit Square.

1202

Select a Length, L , and a Step Rate, ϵ , of the LD Curve in the Unit Square

1204

Initialize Current Length, l , to Zero, and Initialize Current Position (x, y) , (e.g., to $(0,0)$)

1206

Increment x and y and Apply Boundary Conditions at Borders of Unit-Square (e.g., Toroidal, Reflectance, or Both), Generating a Low Discrepancy Sequence Point (x_n, y_n)

1208

 $I < L?$

1210

No

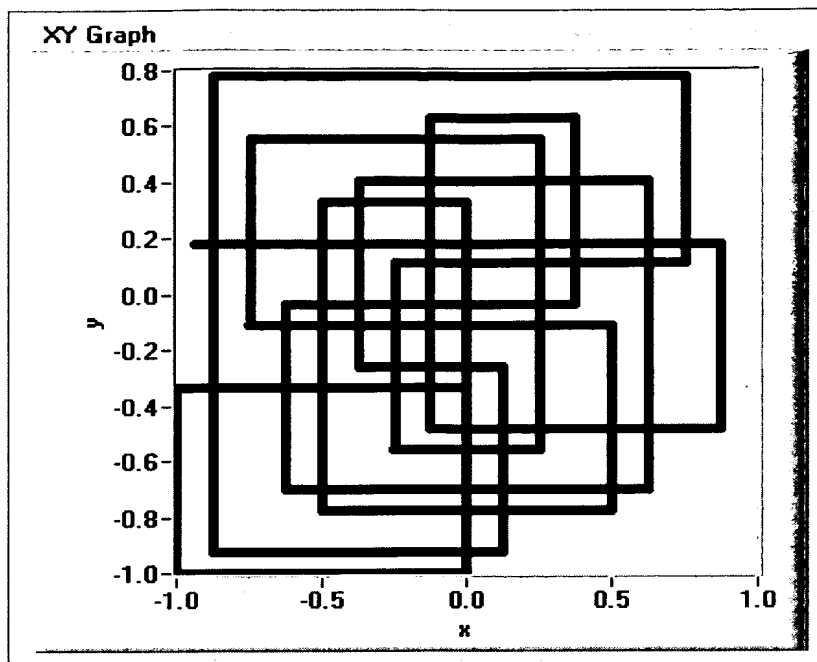
Yes

Output Generated Low Discrepancy Sequence of Points Representing the Low Discrepancy Curve

1212

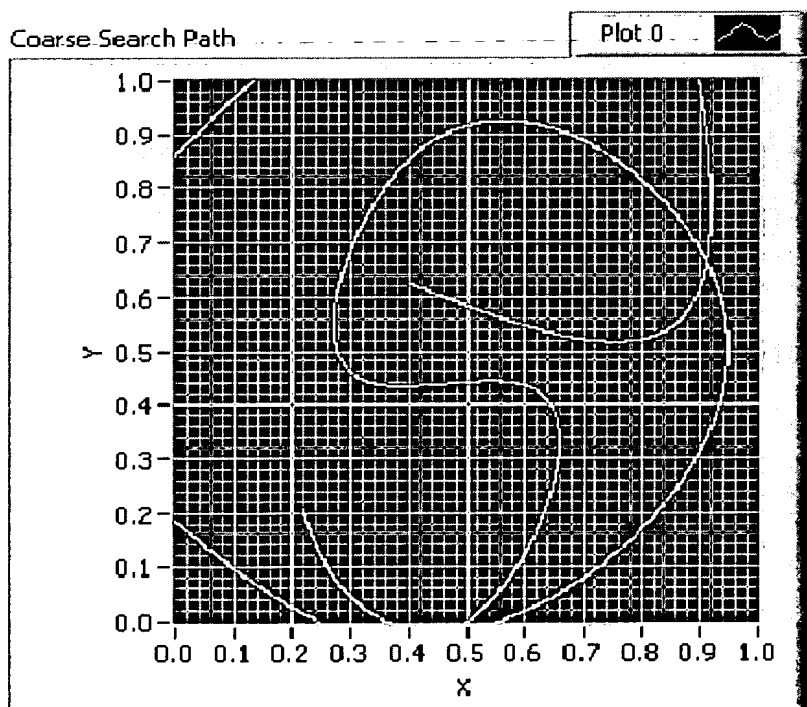
Figure 12B

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Beginning of a Low Discrepancy Curve based on a specific Halton Sequence in 2d

Figure 13A



Splined Low Discrepancy Curve coarse search

Figure 13B

Distribution of Travel Distances

Low Discrepancy
Conformal Spiral

Travel Distance	Low Discrepancy Frequency (%)	Conformal Spiral Frequency (%)
0.5	51.0	66.0
1.0	38.0	38.0
1.5	22.0	22.0
2.0	12.0	12.0
2.5	4.0	4.0
3.0	4.0	4.0
4.0	1.0	1.0
5.0	0.5	0.5
6.0	0.5	0.5
7.0	0.5	0.5
8.0	0.5	0.5
9.0	0.5	0.5
10.0	0.5	0.5

Figure 13C

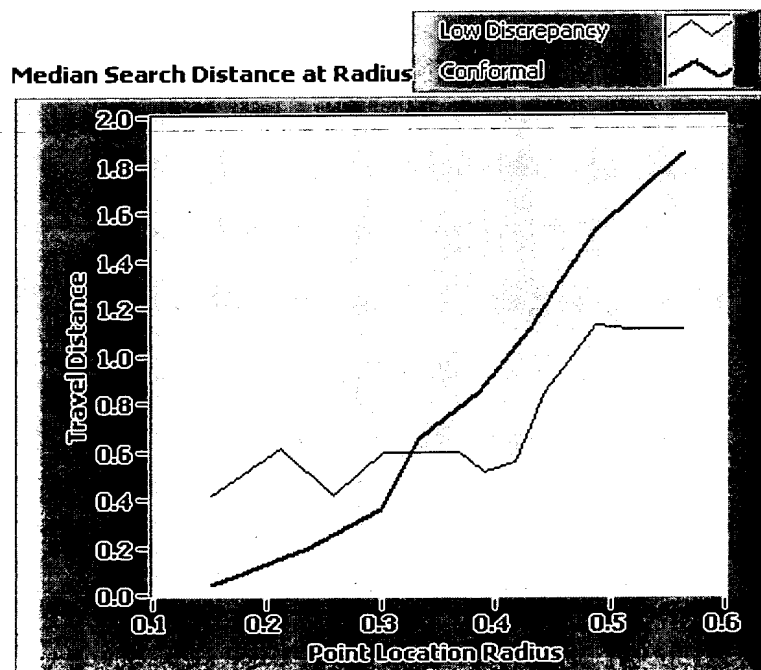


Figure 13D

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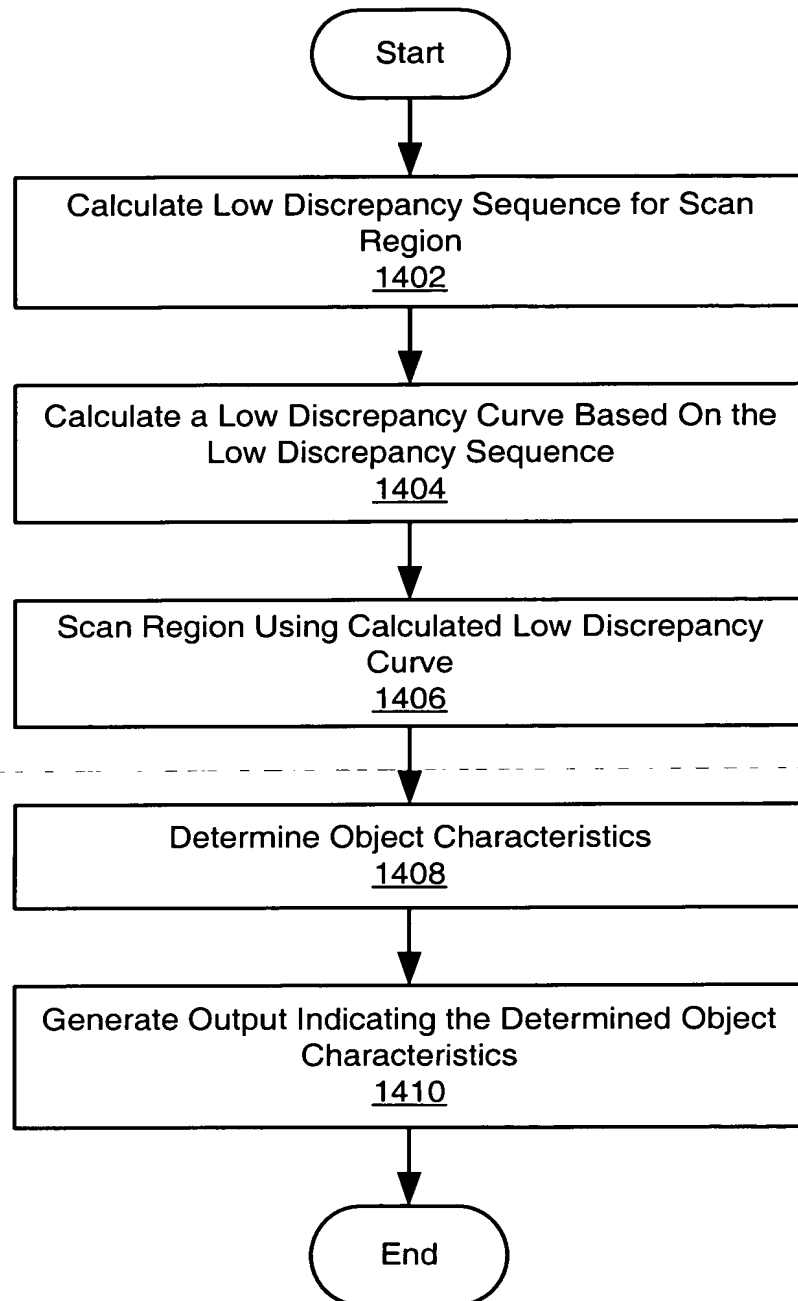
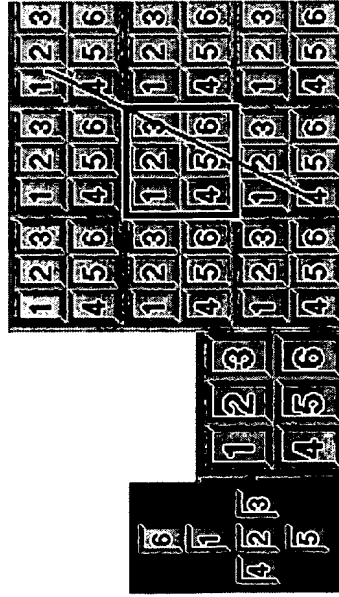
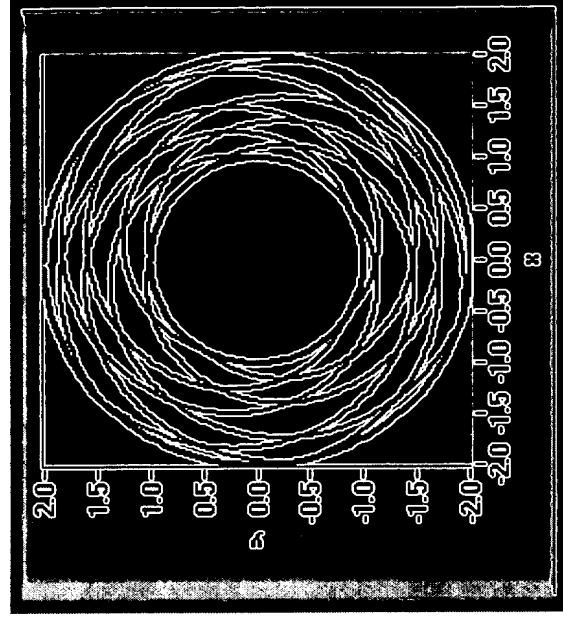


Figure 14



Tiling of the plane and relation to the surface of the unit cube

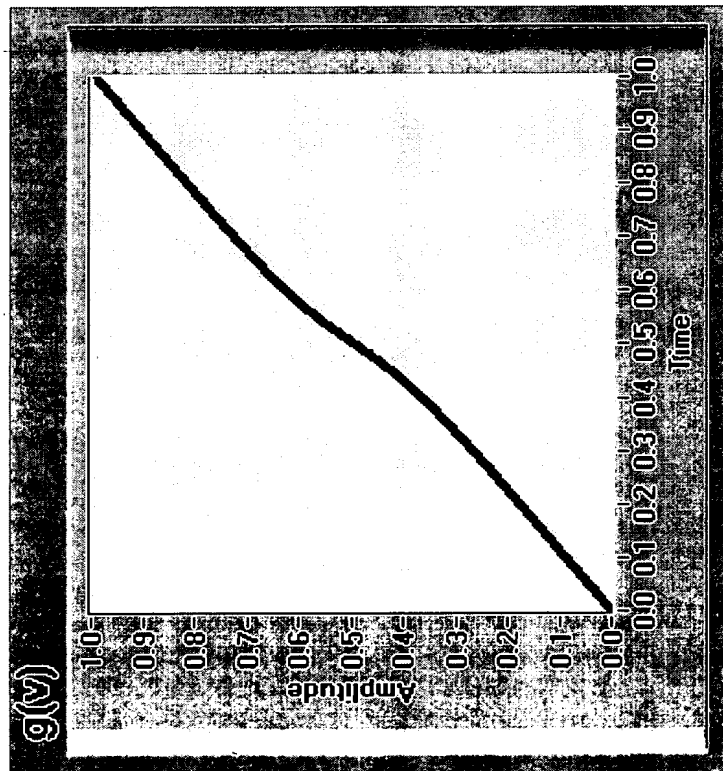
Figure 15A



Low-discrepancy curve in a ring

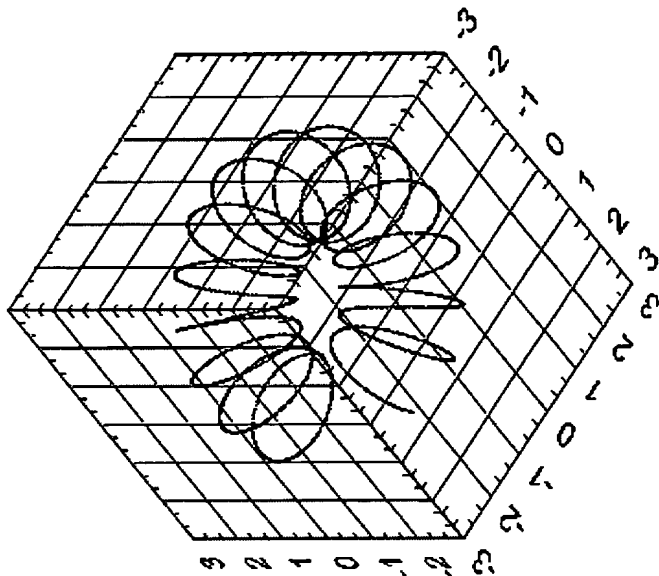
Figure 15B

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Low Discrepancy Preserving Mapping Function

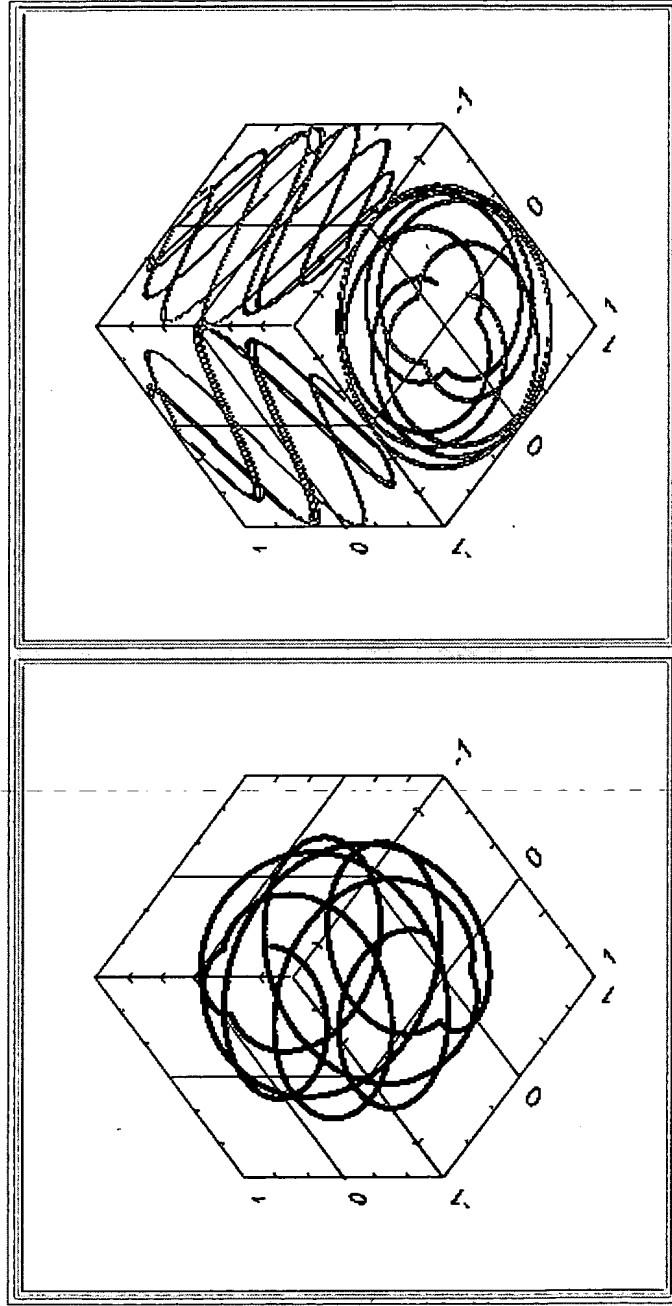
Figure 15C



Low-discrepancy curve filling the surface of a torus

Figure 15D

108090" 08697860



Low-discrepancy curve on a sphere
(left) and projections (right)

Figure 16

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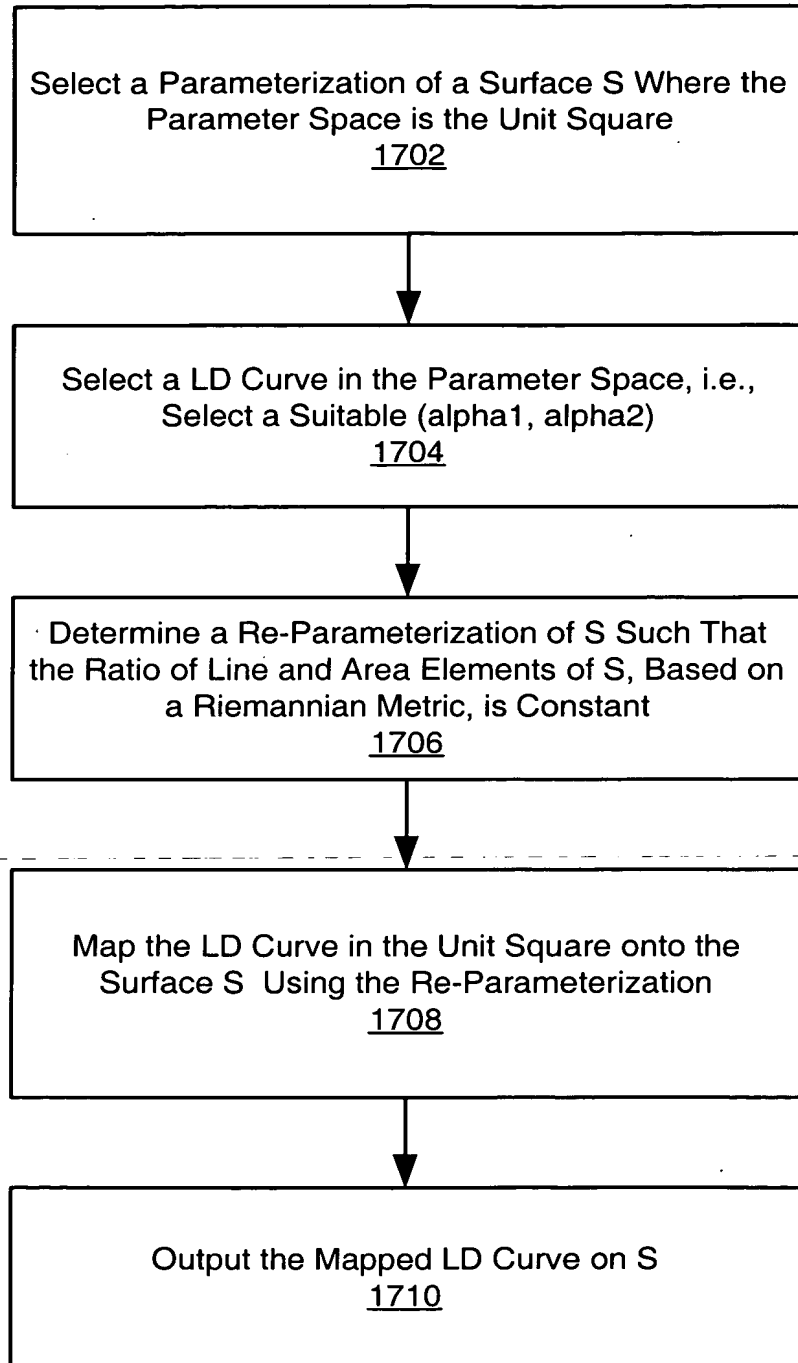
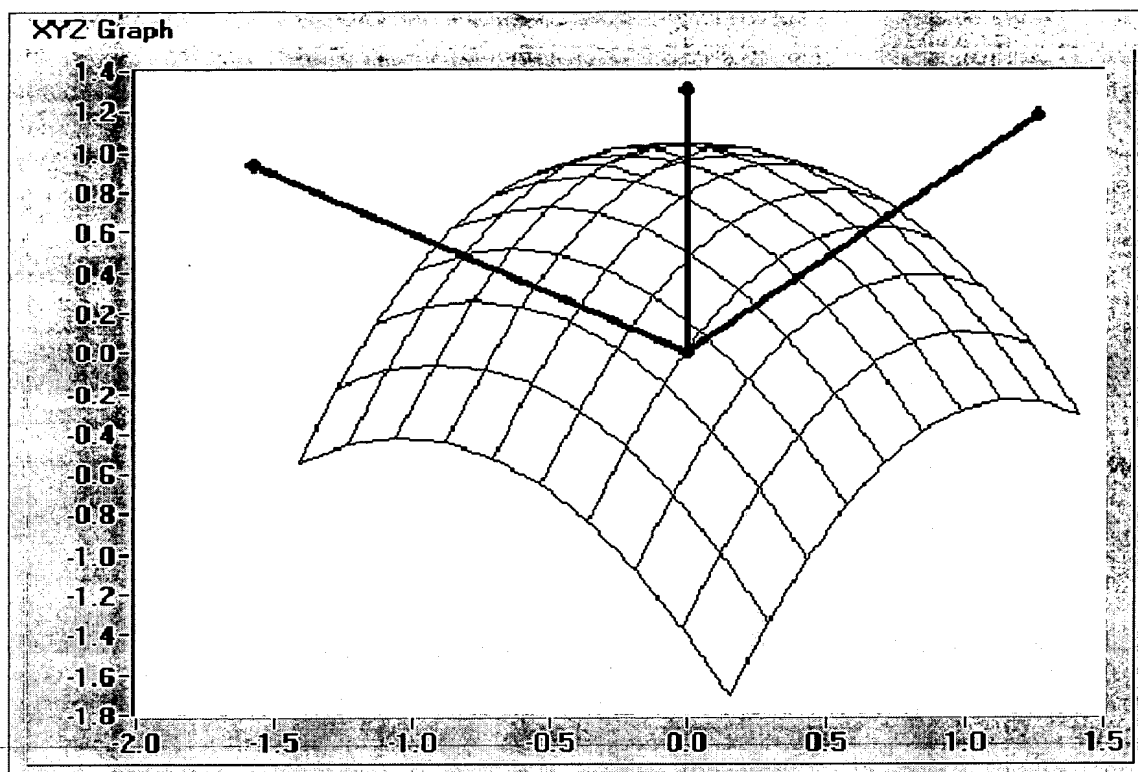


Figure 17

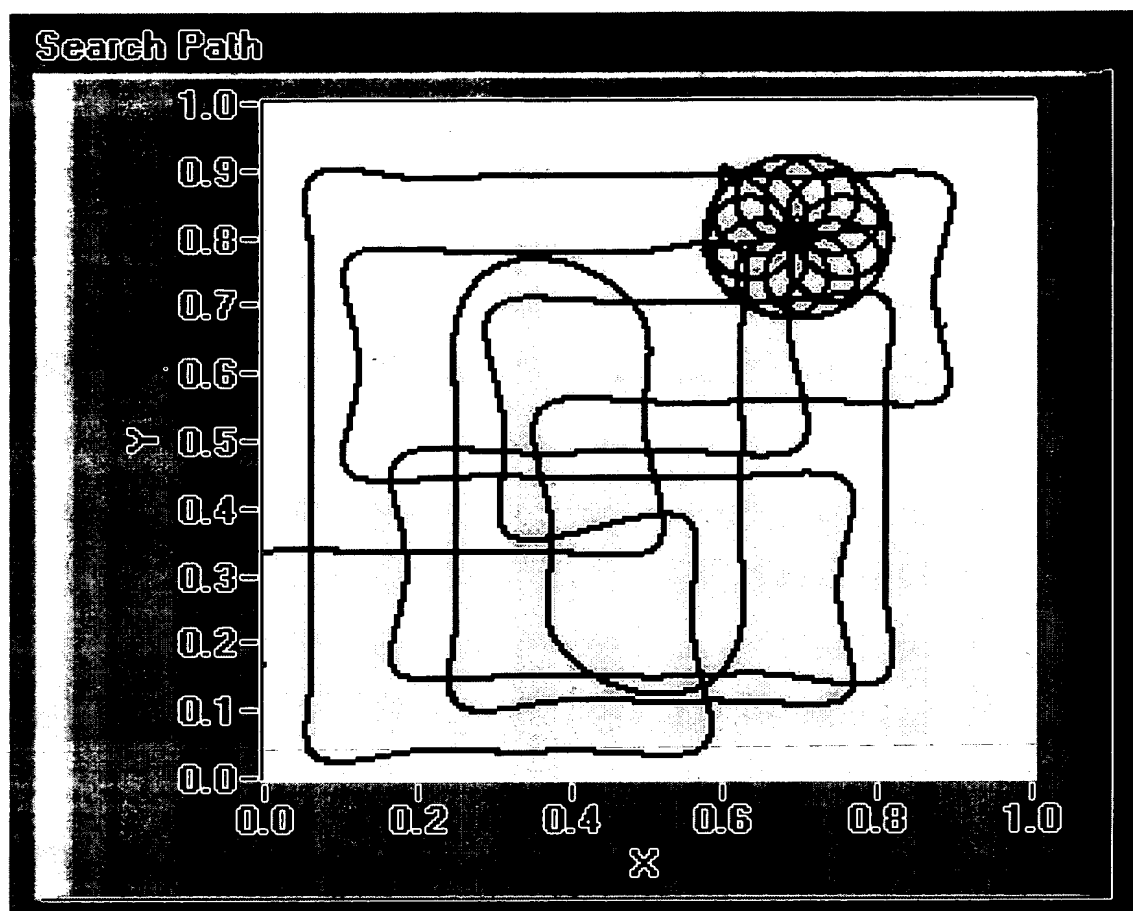
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Surfaces can be scanned efficiently when the term low discrepancy sequence/ curve can be generalized, e.g. based on metrics on the surface.

Figure 18

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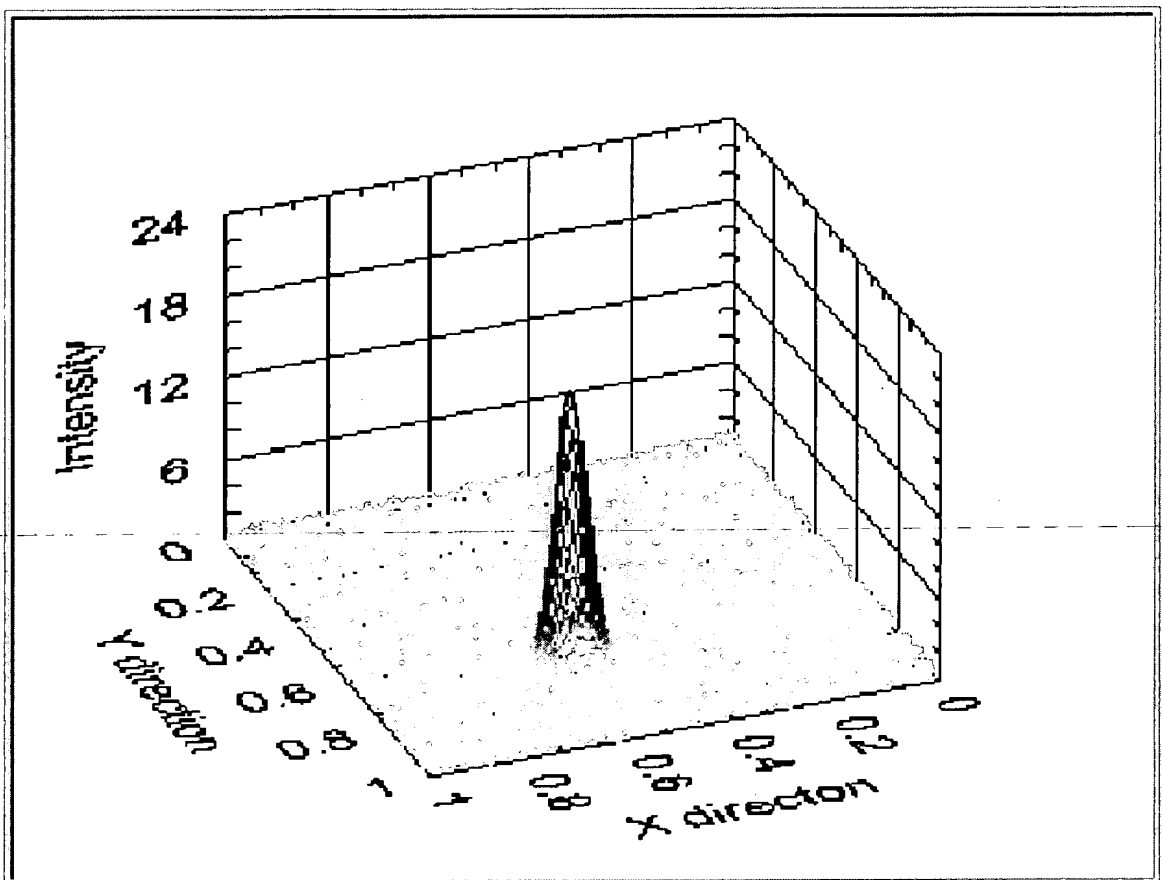


Splined Low Discrepancy Curve coarse search with refined final approach

Figure 19

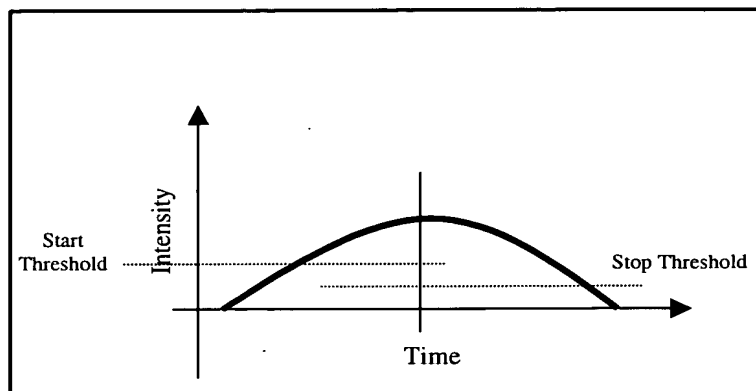
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Intensity Field Distribution in Search Area

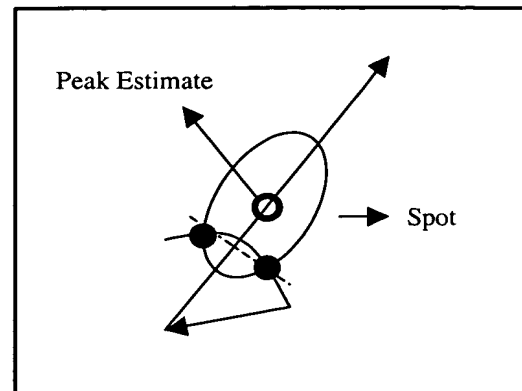


Beam intensity distribution in search area

Figure 20



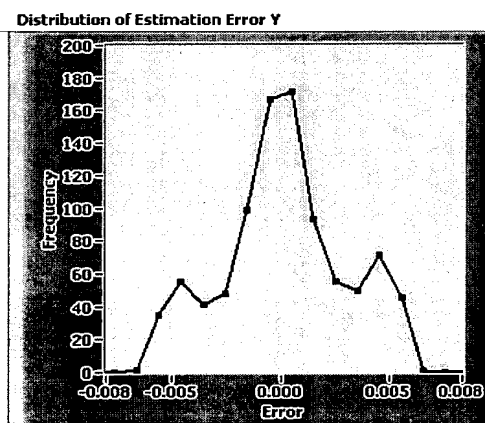
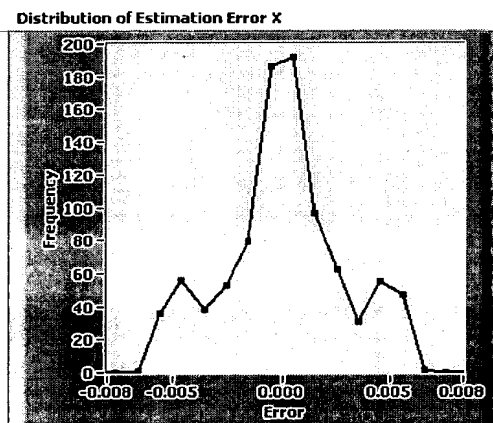
Location of the Peak



Initial Final Approach Move

Figure 21A

Figure 21B



Error distribution of the estimated peak X coordinate error (left) and Y coordinate error (right)

Figure 21C

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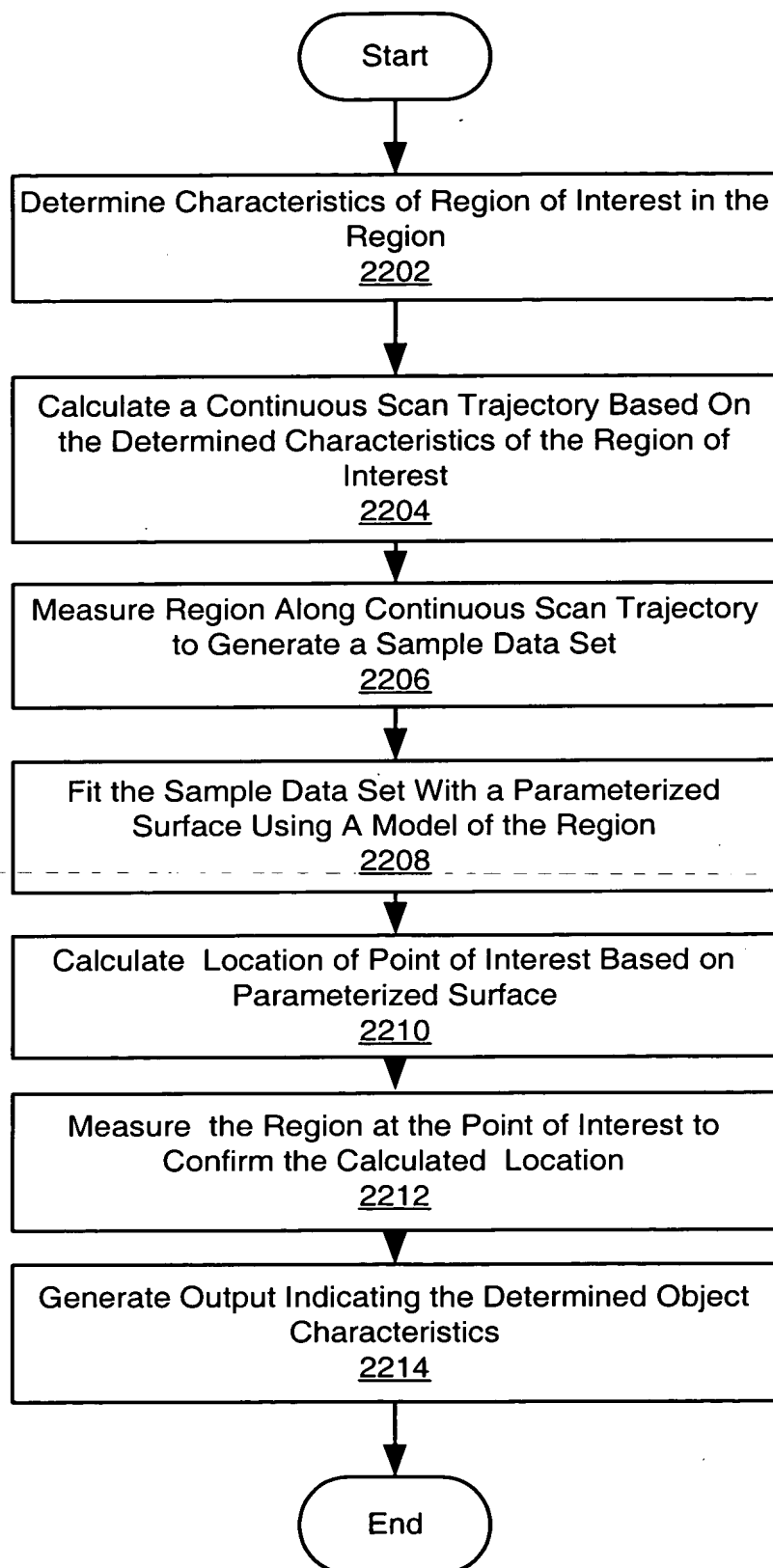


Figure 22

09876980-060801

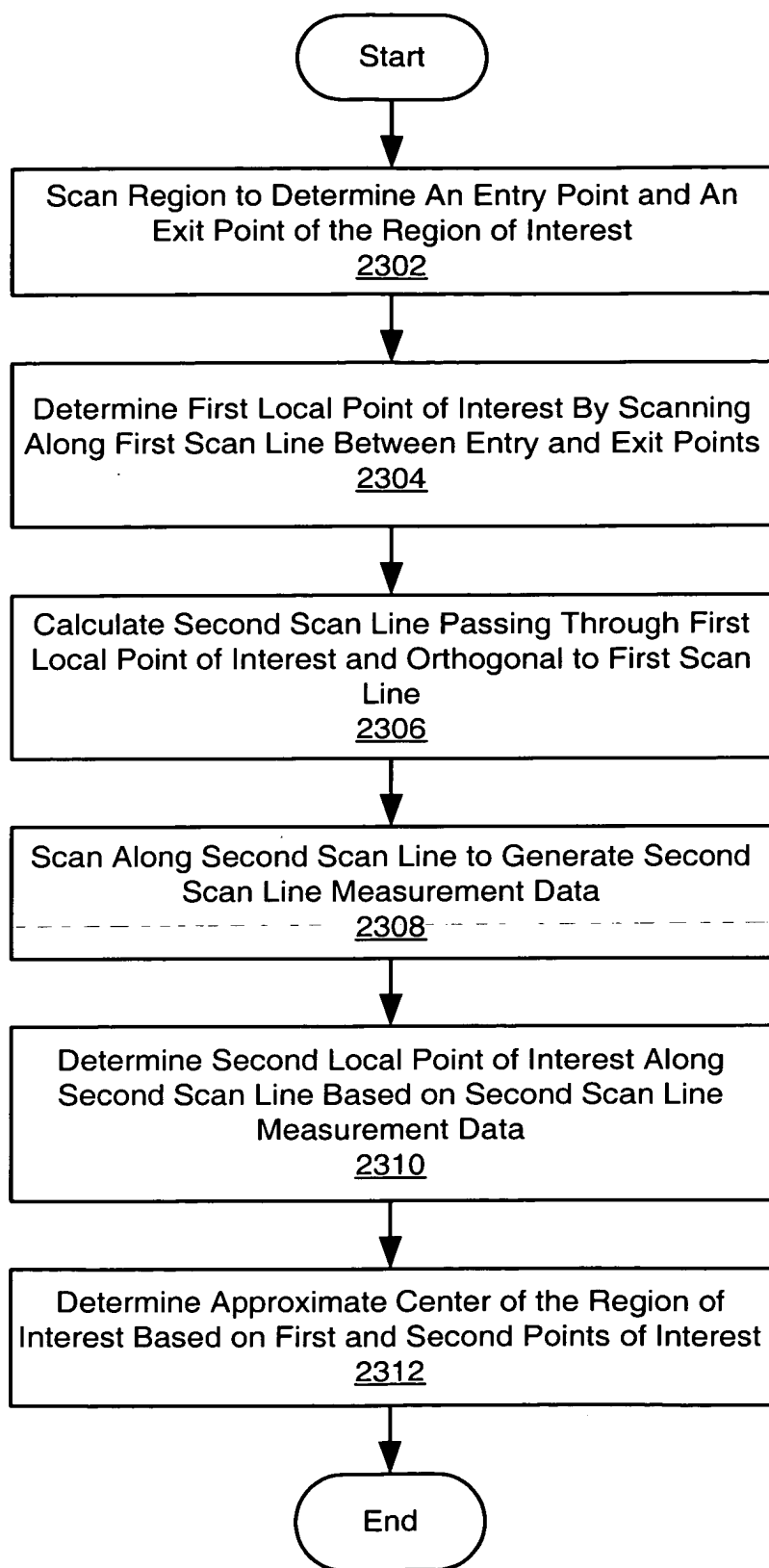


Figure 23